

September, 2009

CURRICULUM VITAE

Name: Arthur Andrew Hurwitz, Ph.D.

Date and Place of Birth: April 21, 1965, Waltham, Massachusetts

Citizenship: United States

Marital Status: Married, 2 children

Education:

1987	B.S., Tufts University, Medford, MA Biology, French, Cum Laude
1991	M.S., Albert Einstein College of Medicine of Yeshiva University, Sue Golding Graduate Division, Bronx, NY. Pathology
1994	Ph.D., Albert Einstein College of Medicine of Yeshiva University, Sue Golding Graduate Division, Bronx, NY. Pathology

Brief Chronology of Employment:

1987-1989	Research Technologist, Massachusetts General Hospital, Boston, MA.
1989-1994	NIMH Predoctoral Fellow, Albert Einstein College of Medicine, Bronx, NY.
1994-1997	Postdoctoral Fellow, Cancer Research Laboratory, University of California, Berkeley, CA.
1997-1999	Fellow, Department of Defense Breast Cancer Research Program, Cancer Research Laboratory, University of California, Berkeley, CA.
1999-2008	Assistant Professor, Department of Microbiology and Immunology and Urology, SUNY Upstate Medical, Syracuse, NY.
2003-present	Principal Investigator, Laboratory of Molecular Immunoregulation, Center for Cancer Research, National Cancer Institute, Frederick, MD.
2005-present	Adjunct Assistant Professor, Department Microbiology and Immunology, The George Washington University School of Medicine, Washington, DC.

Teaching Experience:

1985	Course Instructor, Experimental College, Tufts University
1986	Teaching Assistant, French Department, Tufts University
1990	Teaching Assistant, Graduate School Biochemistry Course
1990-1993	Tutor, Medical School Immunology and Cell Biology Courses
1996-1998	Course Instructor, Department of Molecular and Cell Biology, University of California, Berkeley
1999-present	Assistant Professor, SUNY Upstate Medical University
2003-2008	Instructor, AAI Introductory Course in Immunology
2005-present	Adjunct Assistant Professor, The George Washington University
2008-present	Instructor, FAES Course "Immunology", NIH

Society Memberships:

American Association for the Advancement of Science
American Association of Immunologists
American Association for Cancer Research

Honors and Other Special Scientific Recognition:

1987	Cum Laude, Tufts University
1993	Sue Golding Award Lectureship
1997-1999	Co-Investigator, CaPCURE Foundation, Santa Monica, CA.
1999-2002	Young Investigator, CaPCURE Foundation, Santa Monica, CA.
2001	Pfizer-Showell Travel Award, American Association of Immunologists, Annual Meeting
2001-2004	National Multiple Sclerosis Society, Research Grant
2001	Asa Gray Memorial Lecture, Utica College
2002-2007	Member, AAI Committee on Public Affairs
2002	Junior Faculty Travel Award, American Association of Immunologists, Annual Meeting
2002-2005	Department of Defense Prostate Cancer Research Program, Young Investigator
2002-date	Faculty member, Faculty 1000, Immunology Section, Biomednet Central
2003-2007	American Cancer Society, Research Scholar Award (declined)
2004	Program Committee, AACR Annual Meeting
2005-present	Section Editor, Journal of Leukocyte Biology
2007	Co-Editor, <u>Tumor-induced immune suppression: Mechanisms and therapeutic reversal</u> , Springer.
2007-present	Member, AAI Education Committee
2008-present	Abstract Review Committee, Federation of Clinical Immunology Societies (FOCIS) Annual Meeting
2009	Organizing Committee, "Cancer Immunotherapy and Immune Monitoring", Kiev, Ukraine.
2009	Cancer Research Institute Visiting Professor, Russian Academy of Sciences, Engelhardt Institute of Molecular Biology, Moscow, Russia

Invited Lectures, Chairing, and Consultations:

1991	American Association of Neuropathologists. "A model for the development of the blood-brain barrier using human fetal endothelial cells and astrocytes". Baltimore, MD.
1992	FASEB, "Altered expression of TNF α -induced adhesion molecules on endothelial cells in a model of the human blood-brain barrier". Anaheim, CA.
1992	Invited participant, Neuroimmune interactions and their regulation (satellite conference of the VIII International Congress of Immunology. "Adhesion molecule expression in the central nervous system: A study of astrocytes and the blood-brain barrier endothelium". Budapest, Hungary.

- 1993 American Association of Immunologists. 'Expression of leukocyte adhesion molecules by endothelial cells in a tissue culture model of the blood-brain barrier'. Denver, CO.
- 1993 Invited Participant, Third Annual Neuro-AIDS Meeting (NIAID). 'The role of the blood-brain barrier in HIV infection of the CNS'. Portland, ME.
- 1995 FASEB. "The role of B7.2 in anti-tumor immunity". Atlanta, GA.
- 1996 American Association of Immunologists. "T cell-mediated tumor immunity in a murine model of mammary carcinoma". New Orleans, LA.
- 1998 FASEB. 'Rejection of a transplantable prostate tumor as a consequence of CTLA-4/B7 blockade in dependent on both T cells and NK cells'. San Francisco, CA.
- 1999 American Association of Immunologists. 'Immunotherapy for prostate cancer in the TRAMP model using a GM-CSF-expressing vaccine and CTLA-4 blockade' Washington D.C.
- 1999 Pezcoller Symposium. "Modulation of T cell activation in the anti-tumor and autoimmune responses". Roverreto, Italy.
- 2000-2001 Consultant, Hollis-Eden Pharmaceuticals
- 2000 Invited Speaker, University of Rochester
- 2000 Invited Speaker, Hollis-Eden Pharmaceuticals
- 2001 Invited Speaker, Baylor College of Medicine
- 2001 Invited Speaker, Cornell University
- 2001 Invited Speaker, Roswell Park Cancer Institute
- 2001 FASEB. 'Modulation of tolerance to a pigmentation antigen in a murine melanoma model'. Orlando, FL.
- 2001 Utica College, Asa Gray Memorial Lecture
- 2001 Invited Speaker, University of Connecticut Cancer Center
- 2002-2003 Consultant, CytoCure LLC
- 2002 Invited Speaker, National Cancer Institute
- 2002 Invited Speaker, Roswell Park Cancer Institute
- 2004 Chair, Minisymposium, "Molecular mechanisms of anti-tumor immunity", AACR Annual Meeting
- 2004 AACR Annual Meeting, 'Inducing Tumor Immunity and Autoimmunity by Modulation of Antigen Presentation and CTLA-4 Blockade'
- 2004 Invited Speaker, Wisconsin Blood Research Center
- 2005 Chair, Minisymposium, AACR Annual Meeting
- 2005 Invited Speaker, The George Washington University School of Medicine
- 2006 Invited Speaker, "Mouse Models of Human Cancer Consortium" Semiannual Meeting.
- 2006 AACR Special Conference on Tumor Immunology, "Tumor-Specific CD8⁺ T Cells Acquire Suppressor Function Upon Transfer into a Prostate Tumor-Bearing Host", Miami, FL
- 2007 Invited Speaker, Innovative Minds in Prostate Cancer Today (IMPACT) Meeting, Atlanta, GA.
- 2007 Invited Speaker, Symposium on Immune-Mediated Disease, "Modulating T Cell responses to Elicit Tumor Immunity", Moscow, Russia.
- 2007 Invited Speaker, NCI Special Symposium on Cancer and Inflammation.

- 2008 Speaker, NCI CCR-NIAID Symposium "Manipulation of the Host Immune Response: Exploring the Crossroads of Infectious Disease and Cancer"
- 2008 Invited Speaker, AACR Special Conference "Tumor Immunology: New Perspectives."
- 2008 Invited Speaker, Laboratory of Human Carcinogenesis, CCR, NCI, NIH.
- 2009 Invited Speaker, Bristol Immunology Group, Bristol, UK
- 2009 Invited Speaker, Keystone Symposium on Regulatory T Cells, Keystone, CO.
- 2009 Invited Speaker, Cancer Immunotherapy and Immune Monitoring, Kiev, Ukraine
- 2009 Invited Speaker, Tumor Board, National Cancer Institute, Bethesda, MD

Review and Committee Activities:

- 1996- present Reviewer, Journal of Immunology
- 2000-2003 Scientific Peer Reviewer, DOD Breast Cancer Research Program, Clinical and Experimental Therapeutics 4
- 2000-2004 Ad Hoc Reviewer, Dutch Cancer Society, Clinical Cancer Research, Cancer Immunology and Immunotherapy, Cancer Research, Biomed Central
- 2001-2002 Scientific Peer Reviewer, DOD Prostate Cancer Research Program, Clinical and Experimental Therapeutics 2
- 2002-2004 Reviewer, NIH Grants Review Branch, P01 Review Panel
- 2002-2003 American Heart Association, Cell Trans & Metab/Immunology & Microbiology
- 2003-2004 Scientific Peer Reviewer, DOD Prostate Cancer Research Program, Immunological Sciences.
- 2004-present NIH, Immunology Interest Group
- 2004- 2008 NCI Frederick Animal Care and Use Committee
- 2005- present NCI Tenure Track Investigator Committee
- 2007- present NIH Study Section IRG: Cancer Immunology and Immunotherapy (CII)
- 2009 Reviewer, Israel Science Foundation
- 2009 Reviewer, Italian Association for Cancer Research

Patents:

"Stimulation of T cells against self-antigens using CTLA-4 blocking agents"
US Patent Application Serial No. B96-002-6, 1999.

Present Address:

14640 Brougham Way
North Potomac, MD 20878

Bibliography:

1. Frisman, D. M., Hurwitz, A. A., Bennett, W. T., Boyle, L. A., Fallon, J. T., Dec, W. G., Colvin, R. B., and Krunick, J. T.: Clonal analysis of graft-infiltrating lymphocytes from renal and cardiac biopsies: Dominant rearrangements of TcR β genes and persistence of dominant rearrangements in serial biopsies. Human Immunol. 32: 208-215, 1990.
2. Frisman, D. M., Fallon, J. T., Hurwitz, A. A., Dec, W. G., and Kurnick, J. T.: Cytotoxic activity of graft-infiltrating lymphocytes correlates with cellular rejection in cardiac transplant patients. Human Immunol. 29: 241-245, 1991.
3. Hurwitz, A. A., Lyman, W. D., Guida, M. P., Calderon, T. M., and Berman, J. W.: Tumor necrosis factor α induces adhesion molecule expression on human fetal astrocytes. J. Exp. Med. 176: 1631-1636, 1992.
4. Hurwitz, A. A., Berman, J. W., Rashbaum, W. K., and Lyman, W. D.: Human fetal astrocytes induce the expression of blood-brain barrier-specific proteins by autologous endothelial cells. Brain Res. 625: 238-243, 1993
5. Hurwitz, A. A., Berman, J. W., and Lyman, W. D.: The role of the blood-brain barrier in HIV infection of the central nervous system. Adv. Neuroimmunol. 4: 100-110, 1994.
6. Hurwitz, A. A., Lyman, W. D., and Berman, J. W.: Tumor necrosis factor and transforming growth factor β upregulate astrocyte expression of monocyte chemoattractant peptide-1. J. Neuroimmunol. 57: 193-198, 1995.
7. Allison, J. P., Hurwitz, A. A., and Leach, D. R.: Manipulation of costimulatory signals to enhance antitumor T-cell responses. Curr. Opin. Immunol. 7: 686-686, 1995.
8. Hurwitz, A. A., Sullivan, T. J., Krummel, M. F., Sobel, R. A., and Allison, J. P.: Specific blockade of CTLA-4/B7 interactions results in exacerbated clinical and histologic diseases in an actively-induced model of experimental allergic encephalomyelitis. J. Neuroimmunol. 73: 57-62, 1996.
9. Chambers, C. A., Krummel, M. F., Boittel, B., Hurwitz, A. A., Sullivan, T. J., Fournier, S., Cassell, D., Brunner, M., and Allison, J. P.: The role of CTLA-4 in the regulation and initiation of T cell responses. Immunol. Reviews. 153: 27-46, 1996.
10. Kwon, E. D., Hurwitz, A. A., Foster, B. A., Madias, C., Feldhaus, A., Greenberg, N. M., Burg, M. B., and Allison, J. P.: Manipulation of T cell costimulatory and inhibitory signals for immunotherapy of prostate cancer. PNAS. 94: 8099-8103, 1997.
11. Hurwitz, A. A., Townsend, S. E., Yu, T. F.-Y., Atherton, J., and Allison, J. P.: Enhancement of the anti-tumor immune response using a combination of interferon- γ and B7 expression in an experimental mammary carcinoma. Intl. J. Cancer. 77: 107-113, 1998.

12. Hurwitz, A. A., Leach, D. R., van Elsas, A., Townsend, S. E., and Allison, J. P.: Manipulation of T cell activation in the anti-tumor immune response. E. Mihich and C. Croce (Eds.). In: The Biology of Tumors. Plenum Press, 1998, pp. 213-219.
13. Allison, J. P., Chambers, C. C., Hurwitz, A. A., Sullivan, T. J., Boitel, B. B., Fournier, S., Brunner, M., and Krummel, M. F.: A role for CTLA-4 mediated inhibitory signals in peripheral tolerance. In: Immunological Tolerance. John Wiley and Sons, 1998, pp. 92-98.
14. Hurwitz, A. A., Yu, T. F-Y., Leach, D. R., and Allison, J. P.: CTLA-4 blockade synergizes with tumor-derived GM-CSF expression for treatment of an experimental mammary carcinoma. PNAS. 95: 10067-10071, 1998.
15. Hurwitz, A. A., van Elsas, A., Leach, D. R., Ziskin, J., Villasenor, J., Truong, T., and Allison, J. P.: Manipulation of T cell activation to generate anti-tumor CTL. M. V. Sitkovsky and P. A. Henkart (Eds.). In: Cytotoxic Cells: Basic Mechanisms and Medical Applications. Lippincott and Williams, 1999, pp. 385-394.
16. Van Elsas, A., Hurwitz, A. A., and Allison, J. P.: Combination immunotherapy of B16 melanoma using anti-cytotoxic T lymphocyte-associated antigen 4 (CTLA-4) and granulocyte/macrophage colony-stimulating factor (GM-CSF)-producing vaccines induces rejection of subcutaneous and metastatic tumors accompanied by autoimmune depigmentation. J. Exp. Med. 190: 355-366, 1999.
17. Kwon, E. D., Foster, B. A., Hurwitz, A. A., Madias, C., Allison, J. P., Greenberg, N. M., and Burg, M. B.: Elimination of residual metastatic prostate cancer after surgery and adjunctive CTLA-4 blockade immunotherapy. PNAS. 96: 15074-15079, 1999.
18. Hurwitz, A. A., Foster, B. A., Kwon, E. D., Truong, T., Choi, E. M., Burg, M. B., Greenberg, N. M., and Allison, J. P.: Combination immunotherapy of primary prostate cancer in a transgenic model using CTLA-4 blockade. PNAS. 60: 2444-2448, 2000.
19. Allison, J. P., Hurwitz, A. A., van Elsas, A., Kwon, E., Sullivan, T., Foster, B., and Greenberg, N.: CTLA-4 blockade in tumor immunotherapy. Rosenberg, S. A. (Ed.). In Principles and Practice of the Biologic Therapy of Cancer. Lippincott, Williams and Wilkins, 2000, pp. 890-895.
20. Hurwitz, A. A., van Elsas, A., and Know, E. D.: Costimulatory wars: The tumor menace. Curr. Opin. Imm. 12: 589-596, 2000.
21. van Elsas, A., Suttmoller, R. P., Hurwitz, A. A., Ziskin, J., Villasenor, J., Medema, J-P., Overwijk, W. W., Resitfo, N. P., Melief, C. J. M., Offringa, R., and Allison, J. P.: Elucidating the autoimmune and anti-tumor effector mechanisms of a treatment based on cytotoxic T lymphocyte antigen-4 (CTLA-4) blockade in combination with a B16 melanoma vaccine: comparison of prophylaxis and therapy. J. Exp. Med. 90: 481-489, 2001.

22. Hurwitz, A. A., Foster, B. A., Allison, J. P., Greenberg, N. M., and Kwon, E. D.: The TRAMP mouse as a model for prostate cancer. Current Protocols in Immunology, chapter 20, 2000.
23. Evans, D. E., Prell, R. A., Thalhoffer, T. J., Hurwitz, A. A., and Weinberg, A. D.: Engagement of OX40 enhances Ag-specific CD4 T cell mobilization/memory development and humoral immunity: Comparison of α OX-40 with α CTLA-4. J. Immunol. 167: 6804-6811, 2001.
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26. Vesosky, B. and Hurwitz, A. A.: Modulating costimulation to elicit tumor immunity. Cancer Immunol. Immunother. 52: 663-669, 2003.
27. Kwon, E. D., Ji, Q., and Hurwitz, A. A.: Operation enduring costimulation: Modulation of B7 receptors to elicit anti-tumor immunity. Chen L. (Ed.). In: The B7 Family Molecules in Health and Disease. Plenum Publishing, 2003, pp. 128-138.
28. Weinberg, A. D., Evans, D. E., and Hurwitz, A. A.: Accentuating tumor immunity through costimulation: A detailed analysis of OX40 engagement and CTLA-4 blockade. Finke, J. (Ed.). In: Cancer Immunotherapy at the crossroads: How tumors evade immunity and what can be done. 2003, pp.173-194.
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33. Shafer-Weaver, K., Anderson, M.J., Malyguine, A. and Hurwitz, A.A. 2007. T Cell Tolerance to Tumors and Cancer Immunotherapy. In: Immune Mediated Diseases: from

Theory to Therapy. 601: 357-68. Shurin, M. and Smolkin, Y., eds. *Adv Exp Med Biol*, Springer.

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34. Hu, P., Hurwitz, A. A., and Oppenheim, J. J.: Sensitization with DNA topoisomerase I induces autoimmune responses but not scleroderma-like pathologies in mice. J. Rheumatol. 34(11): 2243-52.
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36. Mazzucchelli, R., Chen, X., Spolski, R., Willette-Brown, J., Hurwitz, A. A., Leonard, W. J., and Durum, S.K. IL-7 Receptor is required for development of T regulatory cells. Blood. 112(8): 3283-92.
37. Singh, V., Ji, Q., Feigenbaum, L., Leighty, R.M., and Hurwitz, A.A. 2009. Melanoma Progression Despite Infiltration by *in vivo*-Primed TRP-2-Specific T Cells. J Immunotherapy. 32(2):129-39.
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39. Shafer-Weaver, K.A., Watkins, S.K., Malyguine, A., Alvord, W.G., Greeneberg, N.M., and Hurwitz, A.A. 2009. Immunity to Murine Prostatic Tumors: Continuous Provision of T Cell Help Prevents CD8 T Cell Tolerance and Activates Tumor-Infiltrating Dendritic Cells. Cancer Res., 69(15): 6256-64.
40. Shafer-Weaver, K.A., Anderson, M.J., Malyguine, A., Greeneberg, N.M., and Hurwitz, A.A. 2009. , *Cutting Edge*: Tumor-Specific CD8⁺ T Cells Infiltrating Prostatic Tumors are Induced to Become Suppressor Cells. *in press: J Immunol.*

Graduate Students

Qingyong Ji, PhD. 2005, Postdoc, Univ of Washington (Dr. Joan Goverman)

Michael Anderson, PhD. 2006, Scientist, Prevalere Scientific, Utica, NY

Kim Shafer Weaver, PhD. 2009, SAIC-Frederick

Katherine Stagliano, 2009-present.

Postdoctoral Fellows

Bridget Vesosky, PhD. 2001-2003. Ohio State University (Laboratory Manager)

Vinod Singh, PhD. 2004-2009,

Thomas Wueest, 2004-2007, University Hospital, Zurich

Watkins, Stephanie 2007-present

Ziqiang Zhu, 2008-present